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ABSTRACT

This study investigated the use of a systems approach to prepare teachers in the use of behavioral objectives. The test group consisted of five male and seven female instructors from Webber College (Florida), a small 2-year institution that prepares women for business careers. An instructor should be able to identify the characteristics of both behavioral objectives and a systems approach to instruction, write acceptable objectives, develop tests based on them, and exhibit an increasingly positive attitude toward them. Instruction using the systems approach involves task analysis, the specification of tasks in behavioral terms, the specification of sequential relationships among the objectives, the determination of instructional activities to achieve the objectives, and the design of procedures to evaluate en-route and terminal student performance. Results of the study show that, at the end of the project, the participants generally could write high-quality behavioral objectives and suitable test items, though some encountered difficulty in sequencing objectives. Attitudes toward the behavioral-systems approach were slightly more positive at the end of the course. The group cited organizational and evaluative qualities as advantages, and susceptability to triviality and lack of flexibility as disadvantages of the approach. Those conducting the course felt that, while the results were positive, more rigorous assessment of success is needed. (JC)

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THE WEBBER COLLEGE PROJECT:

ASSESSING THE FEASIBILITY OF A SYSTEMS APPROACH FOR ORGANIZING LEADERSHIP TRAINING ACTIVITIES

A project sponsored by the National Leadership Training Institute for Vocational and Technical Education Leadership Development.

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JUNE, 1970

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This report was developed from a study conducted at Webber College, Babson Park, Florida, by Keith J. Edwards, Bruce W. Tuckman and Joseph H. Casello of Rutgers University - The State University of New Jersey.

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PREFACE

To assist in achieving the purposes of the Education Professions Development Act, the United States Office of Education appointed a National Panel of Consultants for Vocational Education Personnel Development. The Vocational Education Personnel Development Program is directed toward both pre-service and in-service training of all school personnel engaged in those programs usually regarded as part of vocational education. The Panel of Consultants devotes particular attention to Part F of the Education Professions Development Act (Title I-I of the Vocational Education Act of 1968) and to the opportunities the Act presents for leadership training.

Among the duties of the Panel of Consultants is the development of leadership training institutes. In preparation for meeting this responsibility, the Panel decided to sponsor a study to assess the feasibility of a systematic approach to organizing leadership training activities. This paper comprises the report of that study.

Dr. William B. Logan, a member of the Panel of Consultants and president of Webber College, Babson Park, Florida, offered Webber College as the site for the study. Dr. Bruce W. Tuckman, Dr. Keith J. Edwards, and Mr. Joseph H. Casello, all of Rutgers Unitersity--The State University of New Jersey, had been conducting

research in the systems approach to instructional management and were retained to conduct the study.

The results of the study are promising. The systems model for instructional management presented in this paper and tested in part during the study may well be an effective means of improving the instructional process both within the leadership training institutes planned by the Panel of Consultants and without.

Dr. Robert M. Worthington, Chairman

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TABLE OF CONTENTS

PREFACE. ii

LIST OF ILLUSTRATIONS. v

CHAPTER

I. INTRODUCTION 1

II. A SYSTEMS MODEL FOR INSTRUCTIONAL MANAGEMENT 8

III. THE STUDY 16

IV. THE STUDY RESULTS. 21

V. SUMMARY AND CONCLUSIONS. 27

APPENDIX. 33

BIBLIOGRAPHY. 40

LIST OF ILLUSTRATIONS

Figure — Page

1. Systems Model for Instructional Mangement. . . 9

2. Schedule of Activities 18

3. Averages of Attitude Measurement Responses . .23

CHAPTER I

INTRODUCTION

The idea of planning instruction by systematically analyzing the task, by identifying the specific needs of students and then designing a sequence of learning experiences which will culminate in the students' needs being satisfied, is an idea readily accepted. Not as readily accepted are the implications of the idea. Not as easily agreed upon are the methods through which systematically analyzing the task and sequencing learning experiences can be accomplished efficiently.

A model for such management of instruction is proposed by Dr. Bruce W. Tuckman, primary investigator for the study reported herein. Testing of parts of the model comprised the study.

Statement of the Problem

Needs of the Leadership Training Institutes.--

The Leadership Training Institutes are programs of either an in-service or doctoral nature intended to train cadres of leaders (project directors, potential project directors, state supervisory personnel) from across the nation in maximizing the professional development of vocational education personnel. The training is financed under the Education Professions Development Act (P.L. 90-35). Workshop programs and graduate training programs are planned as the vehicles for leadership training.

The conductors of this study maintain leadership training

can be facilitated with a greater degree of efficiency if a systems approach is developed for use by the cadres in administering their projects. The approach proposed consists of an objective element, a critical path analysis element, and an evaluative element.

The objective element requires the objectives of a particular project to be stated in behavioral terms. The result is a more efficient and relevant means for measuring the degree to which the particular objectives are met. The critical path analysis element provides alternative routes for reaching the stated objectives. The evaluative element provides the necessary inputs to assess the degree to which the stated objectives are met.

The model described in Chapter II provides all three of the above elements. It would allow Leadership Training Institute personnel to state their training objectives in behavioral terms, devise a set of alternate routes toward the objectives, and evaluate their success. Moreover, the systems model can provide the basis for training the trainers as well as the trainees. In training trainers to use the model, the question of whether such training can be accomplished and with what degree of success arises.

Purpose of the study.-- A generalized statement of purpose is that the study was conducted to assess the feasibility of a systems approach to instructional management as a prototype for organizing and conducting leadership training activities. More specifically, the study was undertaken to determine whether persons can be trained in the use of the systems model described in Chapter II, particularly in specifying goals in behavioral terms and in designing evaluative procedures.

Objectives of the study.-- The objectives of the study conducted with the test faculty (Webber College) were:

1. To familiarize the test faculty with the concepts of behavioral objectives and instructional management and their use in instruction.

2. To improve the test faculty's attitudes toward behavioral objectives and instructional management.

3. To train the test faculty in writing complete behavioral objectives in terms of the behavior desired, the situation in which the behavior is elicited, and the criterion of performance.

4. To have the test faculty incorporate behavioral objectives into their regular teaching activities.

Specifically stated, the study project was directed toward measuring the achievement by the Webber College test faculty of the following objectives.

1. Identify the characteristics of behavioral objectives and the systems approach to instructional management.

2. Demonstrate significantly more positive attitudes toward behavioral objectives and instructional management by the close of the study project (than at the onset).

3. Write acceptable behavioral objectives covering one unit of instruction in their particular subject matter.

4. Develop and administer tests based on behavioral objectives.

Recapitulation.-- The purpose of the study, then, was to determine if, and under what conditions, persons could be trained to write and sequence behavioral objectives and develop evaluative procedures, three steps in the model described in Chapter II.

Need for the Study

Need arises simply from the question of whether Leadership Training Institute personnel can be trained to use the systems model described in Chapter II and, if so, with what degree of success.

Definition of Terms

System.-- System theory is a complex concept. The definition shall be approached from a dictionary viewpoint and from system theorists' viewpoints.

Webster's Seventh New Collegiate Dictionary offers the following.

> System . . . 1: a regularly interacting or interdependent group of items forming a unified whole . . . as . . . a group of interacting bodies under the influence of related forces . . . an assemblage of substances that is in or tends to equilibrium . . . a group of body organs that together perform one or more vital functions . . . the body considered as a functional unit . . . a group of related natural objects or forces . . . a group of devices or artificial objects or an organization forming a network esp. for distributing something or serving a common purpose . . . a major division of rocks usu. larger than a series and including all formed during a period or era . . . a form of social, economic, or political organization or practice . . . .

Chin (1, pp. 17-18) is descriptive in his definition.

> The analytic model of system demands that we treat the phenomena and the concepts for organizing the phenomena as if there existed organization, interaction, interdependency, and integration of parts and elements. System analysis assumes structure and stability within some arbitrarily sliced and frozen time period. It is helpful to visualize a system by drawing a large circle. We place elements, parts, variables, inside the circle as the components, and draw lines among the components. The lines may be thought of as rubber bands or strings, which stretch or contract as the forces increase or decrease. Outside the circle is the environment, where we place all other factors which impinge on the system.

Hearn (2, p. 39) states his definition briefly.

> Each system consists of objects which are simply the parts or components of the system; there are attributes which are the properties of the objects; and there are relationships among the objects and their attributes which tie the system together.

Model.-- Webster's Seventh New Collegiate Dictionary defines model as ". . .a description or analogy used to help visualize something (as an atom) that cannot be directly observed . . . ."

Behavioral objective.-- A behavioral objective is a task stated so that the accomplishment of the task can be measured in terms of performance. A behavioral objective statement includes a statement of performance, typically using an action verb, a statement of the conditions under which the performance is to occur, and a statement of the criteria against which the performance is to be evaluated. See Mager (3) and Tuckman (4).

Student-centered curriculum.-- As used in this study, the student-centered curriculum refers to the concept as described by Tuckman (5).

Task analysis.-- Task analysis is the procedure of examining the "job" for which a training sequence is to be developed and specifying the tasks which, when taken together, constitute the "job".

Structural analysis.-- Structural analysis is the process for specifying the sequential relationship among behavioral objectives.

Formative evaluation.-- Formative evaluation is evaluation that appears concurrently with the development of the curriculum.

Summative evaluation.-- Summative evaluation is the overall evaluation of the final instructional package by comparing it with some appropriate standard.

Terminal objective.-- The terminal objective is the parent or end objective of a sequence of instruction.

Enabling objective.-- An enabling objective is an objective within the sequence of objectives leading to the terminal objective.

Iteration.-- Iteration is basically the process of repeating over and over again, in an attempt to try and improve.

Assumption

The study was based on the proposition that leadership training of vocational educators would be more efficient if a systematic (systems) approach to organizing such training were adopted.

Delimitation

The study conducted with the test faculty (Webber College) only covered parts of the systems model described in Chapter II. The study consisted of exposure to the concepts of behavioral objectives, the systems model, and the student-centered curriculum, plus specific training in writing and sequencing behavioral objectives, and specific training in designing evaluative procedures.

Procedure

The systems model for instructional management is presented in Chapter II in graphic and verbal form. To test certain aspects of the model, a study was conducted with a test faculty (Webber College). A description of the study is followed by a presentation of the results of the study. From the results, conclusions are drawn and recommendations are advanced.

Instruments

Three instruments were used to help measure the progress of the study and the results of the study. Each of the three instruments is included in the appendix.

Systems test.-- A multiple-choice test was developed by the consultants for use after the intitial presentation to the test faculty. The purpose was to provide feedback concerning the understanding the test faculty had of the systems concepts presented by

the consultants. As a part of this phase of evaluation, each member of the test faculty was asked to write a behavioral objective appropriate within one of his courses.

Attitude measurement.-- This instrument was devised by the consultants as a variation of Osgood's semantic differential (6). The instrument was administered to the test faculty (Webber College) four times during the study. The purpose was to measure attitude and attitude change toward six concepts along three basic dimensions: evaluative, activity, potency. The six concepts of teacher, systems approach, behavioral objectives, consultants, model, and student-centered curriculum were measured on twelve scales. Each scale allowed for one of seven responses between two extremes.

Project evaluation by test faculty.-- A questionnaire was developed by the consultants to administer to the test faculty as the final activity of the study. The questions were open-ended to allow for as much free-response feedback as possible.

CHAPTER II

A SYSTEMS MODEL FOR INSTRUCTIONAL MANAGEMENT

The systems model proposed for use in developing leadership training activities and around which the study reported in this paper was conducted is presented graphically on page 9.

The model contains three phases. The first phase, analysis, contains three activities in sequence: specification of occupational tasks through task analysis, restatement of tasks as behavioral objectives, and specification of a sequence for behavioral objectives (structural analysis). Following the analysis phase is the synthesis phase. The synthesis phase involves two activities occurring in parallel, specification of instructional activities and design of evaluative procedures. Finally, the operation phase includes two simultaneous activities, carrying out instructional activities and collecting evaluative data.

Following these three phases is a fourth activity, a feedback and iteration wherein the data collected during the operation phase are fed back into the analysis phase so the analysis can be tested, validated, and redesigned based on the new input data. This redesign based on feedback is then followed through to completion from that point.

Analysis

Task analysis.-- Task analysis, the first step in the systems model, is the procedure of examining the job for which a training program is to be developed and specifying the tasks which, when taken together, constitute the job. Task analysis has been most heavily employed in the vocational or occupational field. In the present context of

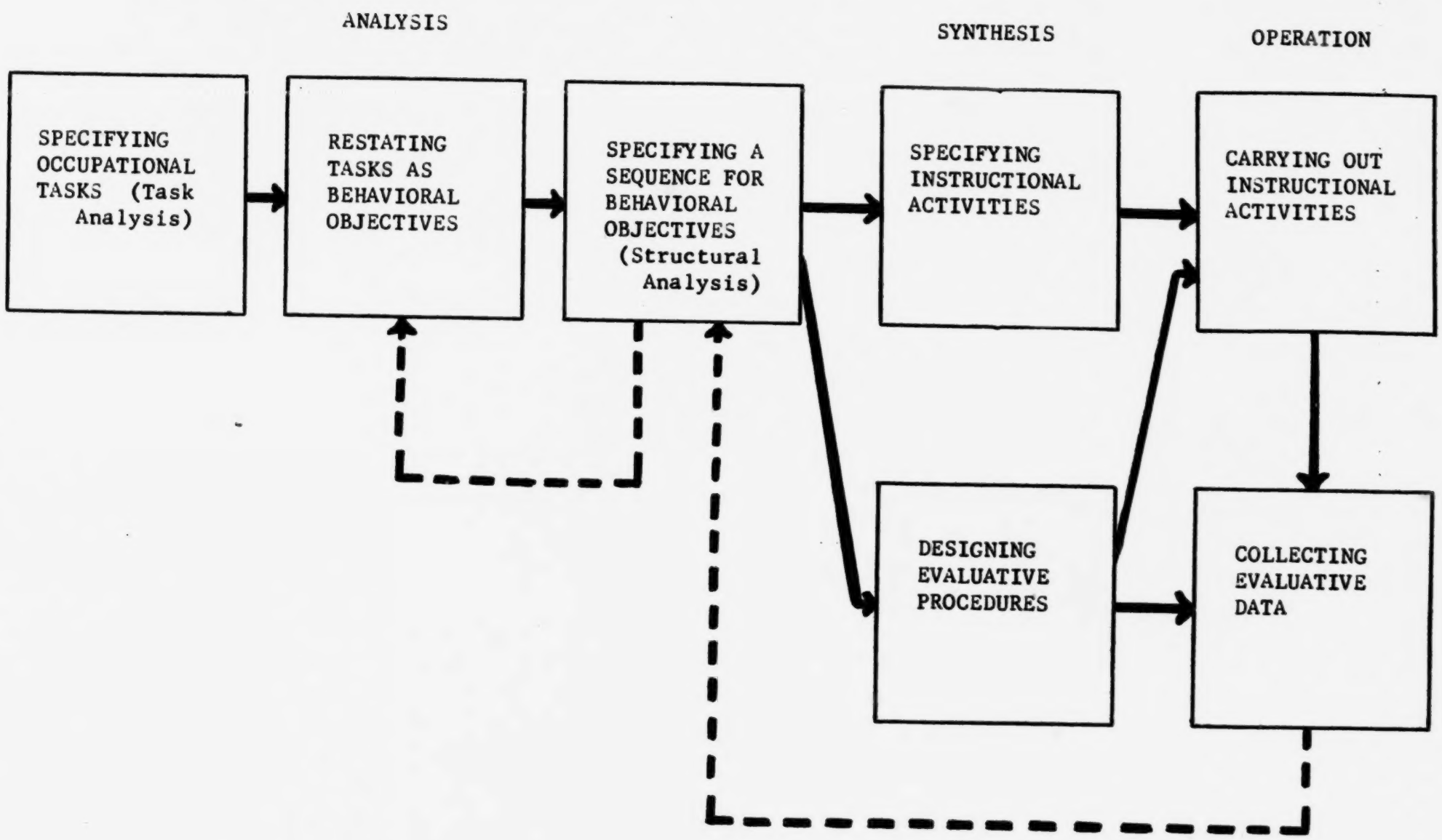

Fig. 1.--Systems model for instructional management

considering an occupation such as a leadership position in vocational education, the tasks that a leader in vocational education is to perform must be specified. Through the use of such a task analysis, a description of the full range of activities that make up such an occupation results.

Behavioral objectives.-- In order for tasks, identified through task analysis, to be suitable building blocks for a systematic curriculum design, they must be put in a form where they can be used for sequencing, instructional materials design, and evaluation. The behavioral objective is a useful rendition of the goal statement for the above purposes. Therefore, the second step in the systems management process is to restate the tasks identified through task analysis in the form of behavioral objectives.

A behavioral objective includes a statement of performance (typically using an action verb), a statement of the conditions under which the performance is to occur, and a statement of the criteria against which the performance is to be evaluated. By the systematic use of performance language and by the specification of conditions and criteria, the behavioral objective becomes a useful device for subsequent steps in the systematic approach. However, it should be emphasized that the arbitrary selection of instructional material which is then converted to behavioral objectives is not consistent with the total philosophy of this approach. The first step is the specification of the tasks relevant to an occupation.

Structural analysis,-- After the relevant behavioral objectives have been developed, the next step is to carry out a

structural analysis. Structural analysis is a technique for specifying the sequential relationship among behavioral objectives. With regard to learning activity as specified by a behavioral objective as a terminal point, three questions can be asked. What competencies can a learner achieve only after prior achievement of the one in question? What competencies must a learner have achieved already in order to achieve the one in question? What competencies are reasonably independent of and, therefore, can be taught concomitantly with the one in question?

Through structural analysis, it becomes possible to specify a sequence of instructional objectives which, when put together in the order specified, should maximize movement from entry into instruction to the attainment of some final goal. This analysis provides the instructional designer or manager with a map to follow in setting forth the order of instructional activities to maximize the probability that each activity will be successful.

Synthesis

Specifying instructional activities.-- When the sequence of behavioral objectives has been specified, the instructional manager is ready to specify instructional activities. He has already produced a thorough analysis of the training as tasks, as behavioral objectives, and as behavioral objectives located in a sequence with their relationships one to the other specified. The task remains to design instructional activities which will be aimed at the achievement of these sequenced behavioral objectives.

A wide variety of possibilities exist, but the purpose of this paper is not to design instructional activities. Suffice it to

mention that instructional activity should require some action or participation on the part of the learner, and it should take advantage of multiple instructional alternatives utilizing the full range of media and technology available; that it should prescribe individual or small group activities where teachers represent one of many instructional resources, and that the material should allow the student to carry out the activities at his own speed and in his own way in order to guarantee his own competence. The instructional activities must include the opportunity for evaluation, not only of the student, but of the instructional process and the instructional materials as well.

Designing evaluative procedures.-- Three types of evaluation are appropriate for discussion here. The first type of evaluation is the monitoring of the performance of each student as a basis for making decisions about his further progression in a particular sequence or his movement on to other sequences. Individually oriented instruction based on the systems model described herein requires reasonably constant monitoring of student performance and instructional prescriptions based on the level of the performance. In order to accomplish this, reasonably frequent evaluations must be carried out. Thus, evaluative procedures and materials must be developed in conjunction with the development of instructional activities based on the very same behavioral objectives and structural analysis that preceded the development of instructional activities.

The second type of evaluation is called formative evaluation. Formative evaluation represents an attempt to evaluate the behavioral

objectives and their sequencing in order to provide the possibility of improvement in the instructional package. Formative evaluation is ongoing and occurs concurrently with instruction. It provides feedback which will help in improving the instructional materials. Formative evaluation procedures and their relation to structural analysis and behavioral objectives are set forth in detail in Tuckman (4).

The third type of evaluation, called summative evaluation, is the overall evaluation of the final instructional package by comparing it with some appropriate standard (e.g., control groups). The purpose of this stage of evaluation is to determine if the final competencies as specified by the behavioral objectives were attained by the learners. The design of summative evaluation procedures is described in considerable detail in Tuckman (7).

Incorporating such an evaluative model into programs such as the Leadership Training Institutes would not only provide an overall evaluation, but would enable the pinpointing of strengths and weaknesses of the entire instructional sequence.

Operation

Carrying out instruction.-- Carrying out instruction is a reasonably obvious step in the process. Since the sequence of instruction has already been determined and the materials or activities which have been designed to provide the instruction have already been set forth, the process of carrying out instruction is simply to make the instructional activities available to students in the order which has been prespecified.

Collecting evaluative data.-- Collecting evaluative data is also a reasonably straightforward step. That is, what is entailed is simply applying the evaluative procedures during the course of instruction. Typically, this takes the form of automatically administering "end-of-unit" or "end-of-sequence" tests by which individual performance on terminal and enabling objectives can be measured.

The more completely evaluative procedures have been designed and programmed into the overall instructional process, the easier, more complete, and more useful will be the process of collecting evaluative data. Most important within this will be assessments of performance on the terminal objective and each enabling objective, making it possible to determine which of the particular competencies or skills have been mastered.

Feedback and Iteration

The step of feedback and iteration, depicted by dashed arrows in the graphic presentation of the systems model on page 9, is a critical and distinctive feature of the systems model. One of the shortcomings of much instruction as it presently occurs at institutes is that the results of the instructional processes are not systematically collected nor fed back to the designers of the instruction in order that the results can be used to modify the instructional activities and their sequencing. That is to say, instruction as we often see it today is not self-improving. This is most unfortunate, because student performance, as has been suggested above, provides a basis for evaluation not only of students and their learning, but of instructional materials and programs. It is uncommon to see the results of student performance

pooled across students and used as a basis for systematic refinement of instructional activity. Yet, the total of students' performances reflects not only on their own capacities and attention but on the nature and efficacy of the instructional program as well.

Thus, while students are evaluated by examining their individual performances, programs can be evaluated by examining data pooled across all students who have completed the programs. However, this information can be used to its greatest potential only if some system for the specification of instruction is used to which the data can be related in some meaningful way. The systems model proposed herein incorporates this feature.

Iteration prescribes that instructional activity will be carried out again; that is, the process will be reiterated or repeated. It will not be repeated, however, until the evaluative data has been fed back into the model and used to alter the total list of behavioral objectives, the sequence of the objectives, and/or the instructional activities toward attaining the objectives. When this has occurred, a somehwat altered series of instructional activities sequenced in perhaps a different way than had been originally hypothesized, and featuring perhaps more, perhaps fewer behavioral objectives than originally will be made available to students.

CHAPTER III

THE STUDY

The Test Faculty

To test the feasibility of implementing the systems approach to instructional management, a test faculty was selected. The faculty of Webber College, Babson Park, Florida was identified for its balance between the academic and vocational areas.

Webber College is a small, two-year, degree granting institution with the purpose of preparing women for careers in business. The College offers majors in four areas of retailing, in basic business, in business management, and in secretarial education.

The test faculty consisted of twelve members from the Webber College faculty and ranged in ages from twenty-five and two years of teaching experience to sixty and twenty-five years of teaching experience. Five of the test faculty were male and seven were female.

Webber College proved to be an ideal place for implementing a test of the systems model. The administration enthusiastically supported the project and provided the participating faculty members with the flexibility necessary to participate. The administrative support was especially helpful in securing the willing cooperation of each participating faculty member.

Another positive factor at Webber College was the quality of the informal relationships among faculty and administrators. This informal structure facilitated a free flow of information and feedback throughout the project. These factors, in addition to the variety of business and professional backgrounds possessed by each participant, made Webber College an ideal prototypic setting for assessing the feasibility of the systems model and for making relevant inferences to the needs of the Leadership Training Institutes.

The Treatment

The treatment consisted of exposure to the concepts of behavioral objectives, the systems model, and the student-centered curriculum, and to specific training in writing and sequencing behavioral objectives, and specific training in designing evaluative procedures. The presentation on the systems model was based on the material covered in Chapter II, and the presentation on the student-centered curriculum was based on Tuckman's paper on the student-centered curriculum (5).

This section of Chapter III focuses on the approach used in specific training for writing behavioral objectives and developing evaluation based on the behavioral objectives. The training featured content training, writing experience, and feedback.

Content training.-- The specific training given the test faculty centered around the definition of a behavioral objective as a statement which clearly specifies the end performance desired of a learner and includes an action verb specifying the end performance, the conditions under which the performance is to take place, and the criteria by which the performance will be judged to show that the

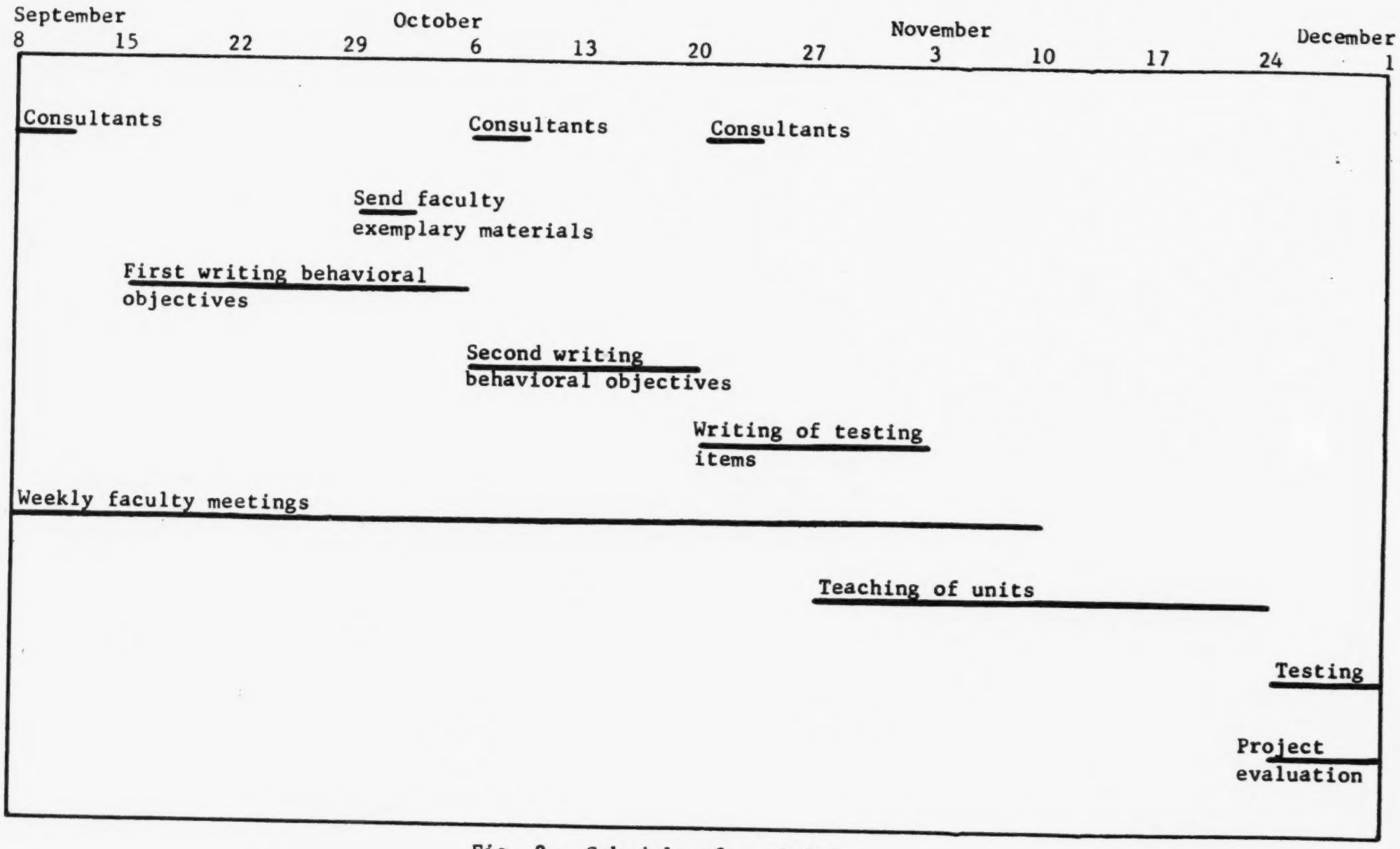

Fig. 2.--Schedule of activities

desired learning has or has not occurred. The training was planned to provide the test faculty with sufficient information on what a behavioral objective is and on how to write one so the test faculty could write behavioral objectives.

Training focused on the use of a list of action verbs: identifying, distinguishing, constructing, naming, ordering, describing, stating a rule, applying a rule, demonstrating, and interpreting. These verbs were explained to the participants, and the value in working from such a pre-specified list was emphasized. Later training activities focused on developing measuring instruments from behavioral objectives.

Writing experience.-- The participants were organized into two groups, those essentially in academic areas and those in vocational areas. The groups met for approximately one hour each week for nine weeks. Prior to each group meeting, participants worked on writing behavioral objectives for one unit of a course they were then instructing. Group meetings provided the opportunity for participants to contribute to one another's writing efforts.

Participants were given the ultimate task of specifying all the objectives for one unit of a course they were then instructing (the unit coming immediately before midterm), arranging the objectives in sequence, and developing a test to measure student performance on the objectives. The group activity was intended to provide motivation, reinforcement, and the opportunity for reality testing. The responsibility for carrying out the writing assignments was an individual one.

Feedback.-- During the course of the study, the test faculty progress was monitored by the consultants. As the participants generated materials in writing, the materials were forwarded to the consultants. Feedback was provided by the consultants going over the materials as a team and formulating recommendations. The recommendations were then transmitted to the participants by one of the consultants who went to Webber College to provide the feedback on a face-to-face basis.

Such feedback was provided on three occasions during the initial nine week period in response to materials generated by the participants. Each participant was expected to generate a list of behavioral objectives for one unit of instruction, a sequence for the objectives, and a test to measure the achievement of the objectives. As the participants worked on this task, they were expected to continually refine their output based on the feedback provided them by the consultants.

CHAPTER IV

THE STUDY RESULTS

Systems Test

The systems test was designed to provide the consultants with feedback concerning the knowledge and competency gained by the participants as a result of the initial training sessions which focused on the systems approach and on behavioral objectives. The systems test is included in the appendix.

Responses to the systems test indicate the test faculty understood the concepts presented. Of the ten questions asked on the test, only two were missed by more than 25% of the test faculty. The two questions so missed were items 2 and 3 which relate to steps in the systems model. The two points were clarified the following day before further training.

Item 11 of the systems test required the participants to write behavioral objectives. The purpose was to determine if the participants already could write behavioral objectives. The item, in essence, was a pretest. The expectation was that participants would show little or no skill in writing behavioral objectives. In terms of the definition of a behavioral objective as presented on page 5 of this paper, none of the responses to item 11 constituted a behavioral objective. This confirmed the initial expectation.

Attitude Measurement

Attitudinal data were obtained with the semantic differential to provide the consultants with periodic feedback concerning the attitudes and attitude changes of the participants toward six concepts central to the study. The attitude measurement form is included in the appendix and is described on page 8 of this paper.

The average responses of the test faculty to each concept for each factor are given in Figure 3 on page 23 of this paper. In general, the beginning scale values clusterd around 5, a mildly positive attitude, and the ending scale values were slightly higher. Of special interest are the responses to the concepts "behavioral objectives" and "systems approach" which are central to the study. The test faculty's reactions to the two concepts were exactly opposite. Attitudes toward "behavioral objectives" initially improved but then tended to return to the original level. On the other hand, attitudes toward "systems approach" initially decreased but then tended to return to the original level.

Apparently, after the consultants' initial presentation, the participants were interested in behavioral objectives but not in a systems approach. After the participants struggled with writing behavioral objectives for a period of weeks, their initial enthusiasm toward the concept decreased while attitudes toward a systems approach increased. The latter result appeared to stem from an increasing recognition of the importance of the principles embodied in a systems approach when formulating behavioral objectives. Comments from the faculty support this contention. As an example, one participant indicated that it became necessary to "re-think" the whole approach to the subject in order to formulate behavioral objectives.

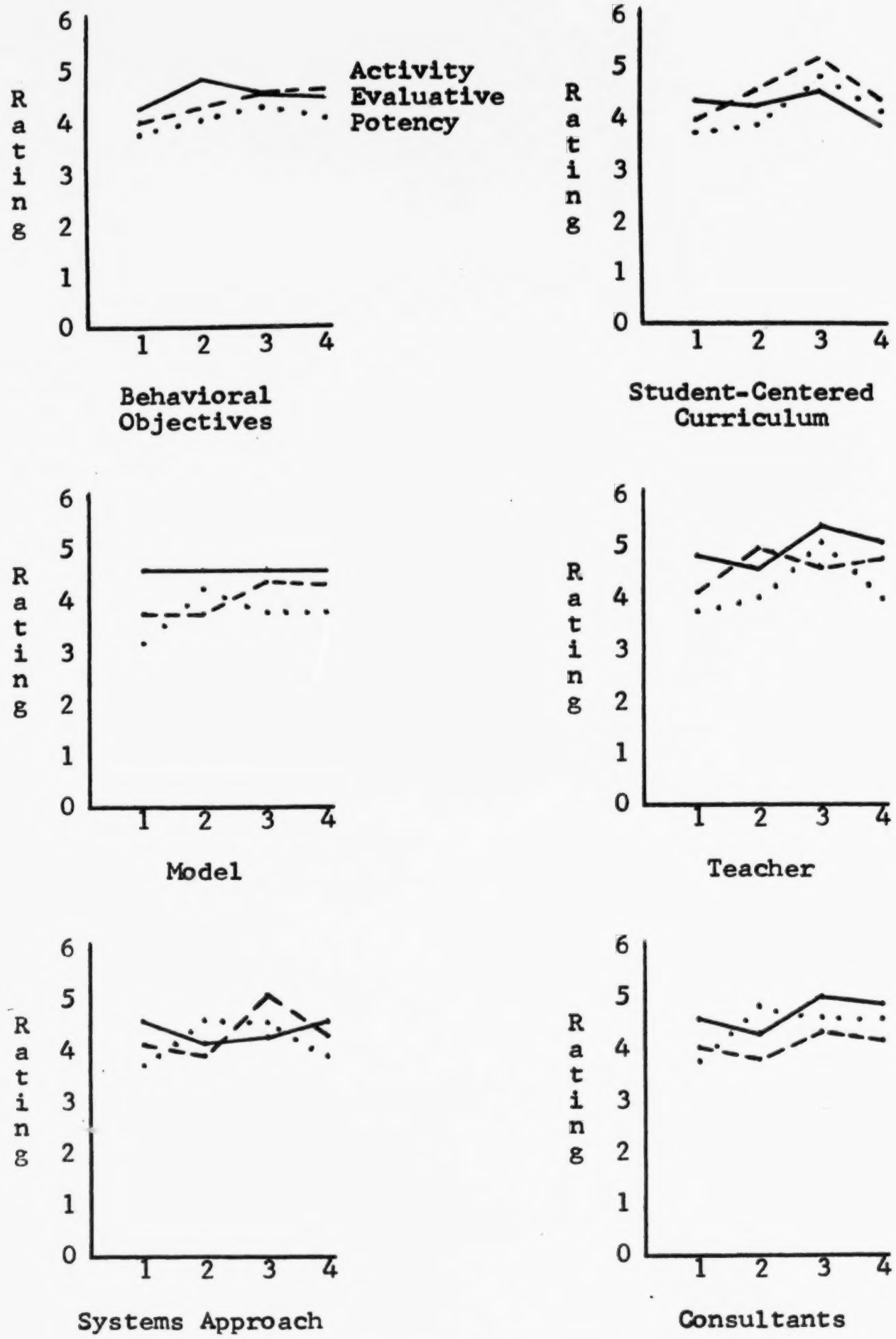

Fig. 3.--Averages of attitude measurement responses

Quality of Participant Output

As an outcome of this project, each of the participants was asked to generate behavioral objectives for one unit of study, sequence the objectives, and generate a test to measure the objectives.

All the participants produced lists of behavioral objectives in sequence, with parallel sets of measurement items. The behavioral objectives were of high quality. They were all behavioral in that they used action verbs. They all stated conditions where appropriate and criteria for evaluation. The conclusion is that the project activities were successful in terms of helping the participants to write suitable behavioral objectives.

Participants were encouraged to sequence their behavioral objectives since sequencing is part of the systems approach. All of the participants attempted to do so and some succeeded. Success in this area of the study was marginal.

Each participant developed a test to measure achievement of the behavioral objectives he had written. The quality of the test items was as high as the quality of the behavioral objectives. The study proved successful in getting participants to generate suitable test items.

Student Performance

At the end of each participant's unit of instruction, he administered to his students test items relating to the behavioral objectives. The resulting performance data were tabulated by the participants and sent to the consultants. In order to provide a common scale for comparison among participants, the percentages of total scores were calculated for each student. The distribution of student

performance on the participant-made tests was toward the high end. However, about 40% of the performances were below the 80% success level, indicating that considerable room for student improvement existed.

It is noteworthy that the systems model employed allows for such a systematic evaluation of student performance in terms of course objectives. Student success or failure reflects on instructional practices. Behavioral objective identification allows performance to be directly related to objectives.

Project Evaluation by Test Faculty

An evaluation questionnaire was designed to provide the consultants with feedback concerning the participants' evaluation of the study. The evaluation questionnaire is included in the appendix.

The order of usefulness of the five major phases of the study follows:

1. Initial presentation by consultants
2. Mailed instructions and exemplary materials
3. Individual sessions with consultant
4. Initial small group activity
5. Weekly faculty sessions

The mean rating for helpfulness of the study was 3.2 on a five point scale. Examples of ways the participants found the study to be helpful to them include: helped to clarify instructional goals, helped to organize course, helped to formulate tests.

The extent to which the participants plan to use in future courses the techniques they learned was indicated as 3.2 on a five point scale. The most common example of how the techniques would be used was in testing. The next most frequent response was in organizing instructional units.

Some of the advantages of behavioral objectives indicated by the faculty are: they help organize thinking, they require an instructor to specify goals, they help evaluate students.

Examples of responses as to the disadvantages of behavioral objectives are: they are not useful for teachers interested in attitudes, they involve trivial bits of information, they are too constraining for courses which should be flexible.

The major recommendation for improving the study was to provide the participants with more information about the concepts and purposes involved prior to the beginning of the activities. Second, the participants requested more specific and structural instructions from the consultants. The participants also indicated that the institution should give them more support in terms of released time or some other means of compensation.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this study was to assess the feasibility of a systems approach to instructional management as a prototype for organizing and conducting leadership training activities. A systems model for instructional management was proposed. Portions of the systems model have been tested on a test faculty to determine whether instructors can be trained to use the model and to identify areas of further research needed to thoroughly test the model.

The conductors of this study maintain leadership training can be accomplished with greater efficiency by applying the systems model to the management of leadership training. The systems model is proposed as the instructional management tool for the Leadership Training Institutes to be financed under the Education Professions Development Act and administered by the Panel of Consultants for Vocational Education Personnel Development.

Chapter II describes the systems model graphically and verbally. Chapter III describes the conduct of the study which was the testing of the model. Chapter IV reveals the results of the study.

The treatment consisted of exposing the test faculty to the concepts of behavioral objectives, the systems model, and the student-centered curriculum as described by Tuckman (5), and to

specific training in writing and sequencing behavioral objectives, and specific training in designing evaluative procedures. The test faculty (Webber College, Babson Park, Florida) was conducted by the consultants through the training in the above sequence. (refer to Figure 2 on page 18).

Conclusions

The major purpose of the study, to assess the feasibility of a systems approach to instructional management as a prototype for organizing and conducting leadership training activity, was not fully accomplished in the time allotted for the project. This was due largely to the short duration of the project, an assessment of what the trainees could reasonably assimilate in that time, and to the geographical distance between the consultants and the trainees.

Therefore, no final conclusions can be reached as to whether such a system is an efficient vehicle for conducting Leadership Training Institutes. A more extensive and penetrating study should be undertaken to test this hypothesis further.

Apparently, the methods utilized by the consultants to train instructors to write acceptable behavioral objectives were successful as evidenced by the high quality of the behavioral objectives produced by the test faculty. The absence of a control group limits the certainty of this conclusion. We can conclude that instructors, as exemplified by the participants from the Webber College test faculty can be trained to write quality objectives in a reasonably short period of time, provided they receive proper training, have opportunities to practice the skill, and receive encouragement and constructive evaluation from someone proficient in the approach.

The attitudes of the participants toward the basic concepts inherent in the systems management approach, as measured by a specially designed semantic differential, began and remained positive throughout the project. An examination of the attitudinal data indicates that little change occurred during the course of the experiment.

Attitudes were initially at an intermediate level, and the small fluctuations ended at that point, or slightly higher. Again, due to the absence of a control group, no conclusion can be drawn with any certainty as to why this was so. Whatever the reasons, the fact that instructor attitudes did remain positive to this approach throughout the project is an encouraging sign.

More intensive interaction and dialogue are necessary between consultants and trainees in order to develop proficiency in the other components of the systems management approach. Evidence was gleaned, especially from particpant response to the project evaluation questionnaire devised by the consultants, that some of the participants were beginning to understand the overall purpose and nature of the systems approach. Many problems arose during the course of the study that required solutions before a more positive step could be taken by all participants toward complete understanding of the overall approach. While most of these problems could be overcome in time, the amount of interaction between participants and consultants during this study proved insufficient to completely overcome the problems.

Student performances on the evaluative instruments designed by the test faculty were generally higher than average. However,

information was insufficient to draw conclusions. Lacking was the presence of a control group to ascertain whether the approach used was the cause of whatever success was realized.

Recommendations

The major conclusion resulting from this project is that the assessment of a systems approach to instructional management as a prototype for organizing and conducting leadership training programs was not fully accomplished. Several reasons are cited for this: the lack of sufficient time, the lack of sufficient interaction between consultants and trainees, the absence of a control group by which to draw more confident conclusions.

Therefore, further study is recommended to more thoroughly assess the systems approach, study which includes the rectification of the problems and omissions mentioned above.

A control group should be utilized to test to a greater degree of certainty whether the procedures used in the study reported herein caused the stated results. The systems management approach and the methods used to introduce it to the test faculty seem to have valuable implications for leadership training. What is needed is more concrete evidence that this assumption is valid.

Future attempts at similar training programs should focus more on all components of the systems management model as being equally important parts, rather than limit efforts to training in one or two portions. In the training of leadership training institute directors, for example, concentration of instructional design would be more beneficial if it were to provide directors with an understanding of the relationship each element has to the others, that one element is

not fully effective without the presence and use of the others. An expertise in writing behavioral objectives is one step. The value of such objectives is not fully realized until skill in devising means to evaluate such objectives is also present.

APPENDIX

SYSTEMS TEST

1. The process of sequencing behavioral objectives into a hierarchy is similar to which of the following management techniques?

   a. Planning-programming-budgeting system
   b. Task analysis
   c. Program evaluation and review techniques (PERT)
   d. Summative evaluation

2. The first task in instructional management is to specify one's objectives behaviorally.

   a. True
   b. False

3. Feedback is relevant to which of the following stages of instructional management? (Check one, two, or all.)

   a. Analysis_____
   b. Synthesis_____
   c. Operation_____

4. The last step in the instructional cycle is

   a. task analysis.
   b. formative evaluation.
   c. synthesis.
   d. summative evaluation.

5. When sequencing behavioral objectives into a hierarchy, one works from the least complex to the most complex objectives.

   a. True
   b. False

6. Feedback in the instructional management systems model is intended for the instructor.

   a. True
   b. False

7. A statement which clearly specifies the end performance desired of the student is a

   a. task analysis.
   b. course criterion.
   c. behavioral objective.
   d. none of the above.

8. The following would be considered to be a good behavioral objective, "The student must understand the Depression of 1929."

   a. True
   b. False

9. Educational "experts" have identified some 25 basic action verbs to be used for behavioral objectives.

   a. True
   b. False

10. The action verb, identify, is considered to be a good verb in the construction of behavioral objectives.

    a. True
    b. False

11. Write a behavioral objective that would be appropriate for your course.

ATTITUDE MEASUREMENT FORM

TEACHER

(E)	1.	dirty	(1)	(2)	(3)	(4)	(5)	(6)	(7)	clean
(A)	2.	sharp	(7)	___	___	___	___	___	(1)	dull
(E)	3.	good	(7)	___	___	___	___	___	(1)	bad
(P)	4.	strong	(7)	___	___	___	___	___	(1)	weak
(P)	5.	rugged	(7)	___	___	___	___	___	(1)	delicate
(E)	6.	unpleasant	(1)	___	___	___	___	___	(7)	pleasant
(E)	7.	honest	(7)	___	___	___	___	___	(1)	dishonest
(A)	8.	passive	(1)	___	___	___	___	___	(7)	active
(E)	9.	beautiful	(7)	___	___	___	___	___	(1)	ugly
(P)	10.	light	(1)	___	___	___	___	___	(7)	heavy
(P)	11.	large	(7)	___	___	___	___	___	(1)	small
(A)	12.	slow	(1)	___	___	___	___	___	(7)	fast

NOTE: Ratings of 1 through 7 were given on each scale in reaction to each of six concepts; teacher, systems approach, behavioral objectives, consultants, model, student-centered curriculum. The scales were categorized into three separate factors, and this sample keys the factors: (E) evaluative, (A) activity, (P) potency.

PROJECT EVALUATION QUESTIONNAIRE

Please indicate your evaluation of the systems analysis project in terms of the following questions.

1. Rank the following activities in terms of their usefulness in your learning how to write behavioral objectives. Use numbers 1 through 5 with 1 indicating the activity most useful and 5 indicating the least useful. If any activity was of no use at all, indicate this by a "0."

   _____ Initial presentation by consultants

   _____ Initial small group activity

   _____ Weekly faculty sessions

   _____ Mailed instructions and examples of behavioral objectives

   _____ Individual sessions with consultant

2. Indicate (with an "X") to what extent the project was helpful in your own teaching.

_____	_____	_____	_____	_____
Extremely helpful				Not helpful at all

Please indicate specific areas of helpfulness (if any).

_____

_____

_____

_____

_____

3. Indicate (with an "X") to what extent you will use the techniques you have learned during this project in future courses.

To great extent				Not at all
_____	_____	_____	_____	_____

Please give specific illustrations of how you could use them.

_____

_____

_____

_____

_____

4. Please complete one or both of the following statements as a function of your present point of view.

a. Behavioral objectives are a good technique because,

_____

_____

_____

_____

_____

b. Behavioral objectives are a poor technique because,

_____

_____

_____

_____

_____

5. If the project were to be done over again, what recommendations would you make for improvement. Make your recommendations in terms of the following.

a. Participating instructors_____

_____

_____

_____

_____

b. Sponsoring institution_____

_____

_____

_____

_____

_____

c. Consultants_____

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BIBLIOGRAPHY

BIBLIOGRAPHY

Cited Literature

1. Chin, Robert. "The Utility of System Models and Developmental Models for Practitioners." Management Systems. Edited by Peter P. Schoderbek, New York: John Wiley and Sons, Inc., 1967.

2. Hearn, Gordon. Theory Building in Social Work. Toronto: University of Toronto Press, 1958.

3. Mager, Robert F. Preparing Instructional Objectives. Palo Alto, California: Fearon Publishers, 1962.

4. Tuckman, Bruce W. The Development and Testing of an Evaluation Model for Vocational Pilot Programs. Final Report, OEG-1-7-008355-2039. New Brunswick: Rutgers--The State University, 1967.

5. Tuckman, Bruce W. "The Student-Centered Curriculum: A Concept in Curriculum Innovation." Educational Technology, October, 1969, pp. 26-29.

6. Osgood, Charles E. "The Nature and Measurement of Meaning." Psychological Bulletin, XLIX (1952), 197-237.

7. Tuckman, Bruce W. Structural Analysis as an Aid to Curriculum Development. Incidental Report #1, SCOPE Program. New Brunswick: Rutgers--The State University, 1968.

Additional References

Ammerman, Harry L., and Melching, William H. The Derivation, Analysis, and Classification of Instructional Objectives. Technical Report 66-4. Alexandria, Virginia: Human Resources Research Office, The George Washington University, 1966.

Anderson, Ronald D. "Formulating Objectives for Elementary Science (Part 1)." Science and Children, September, 1967, pp. 20-23.

An Evaluation Model and Its Application. Washington, D. C.: Association for the Advancement of Science, 1965.

Angell, David, et al. Study of Training Performance Evaluation Techniques. NAVTRADEVCEN Technical Report No. 1449-1, 1964.

Atherton, Frederick W. "Understanding System Theory." Seminar Paper, University of Florida, December, 1967.

Atkins, J. Myron. "Behavioral Objectives in Curriculum Design: A Cautionary Note." Behavioral Objectives: Pro and Con. Florida Association for Supervision and Curriculum Development, December, 1968.

Ausubel, David P. "Psychological Aspects of Curriculum Evaluation." Paper presented at the National Seminar for Vocational Education Research, University of Illinois, May 17, 1966.

Bloom, Benjamin S. (ed.). Taxonomy of Educational Objectives: Cognitive Domain. New York: David McKay Company, Inc., 1956.

Bradfield, J. M., and Moredock, S. H. Measurement and Evaluation in Education. New York: The MacMillan Company, 1957.

Bryan, Glenn L., et al. Electronics Trouble Shooting: A Behavioral Analysis. Technical Report No. 13. Los Angeles: University of Southern California, 1956.

Bushnell, David S. "Evaluative Research Studies." American Vocational Journal, XLI (1966), 17-18.

Coffyn, Lois. "Behavioral Objectives: English-Style." Elementary English, December, 1968, pp. 1073-74.

Cogan, Eugene A. The Evaluation of Systems-Analytic Training Programs. Professional Paper 29-67. Alexandria, Virginia: Human Resources Research Office, The George Washington University, 1967.

Crawford, Lucy. A Competency Pattern to Curriculum Construction. Vols. I-IV. Blacksburg, Virginia: Virginia Polytechnic Institute, 1969.

Crawford, Meredith P. HumRRO Techniques in Course Development. Professional Paper 15-66. Alexandria, Virginia: Human Resources Research Office, The George Washington University, 1966.

EPIC Evaluation Center. Educational Objectives. Tucson: EPIC, 1968.

Flagle, W. H., et al. Operations Research and Systems Engineering. Baltimore: The Johns Hopkins Press, 1960.

Furst, Edward J. Constructing Evaluation Instruments. New York: David McKay Company, Inc., 1958.

Gagne, Robert M. "Abilities and Learning Sets in Knowledge Acquisition." Psychological Monographs, LXXIV, No. 14 (1961).

Gagne, Robert M. "Curriculum Research and the Promotion of Learning." Paper presented at the AERA 50th Annual Meeting, Chicago, February 18, 1966.

Gagne, Robert M. "Problem Solving." Paper presented at the Symposium on Human Learning, University of Michigan, January 31, 1962.

Gagne, Robert M. (ed.). Psychological Principles in Systems Development. New York: Holt, Rinehart and Winston, 1962.

Gagne, Robert M. "The Acquisition of Knowledge." Psychological Review, LXIX (1962), 355-365.

Gagne, Robert M. The Conditions of Learning. New York: Holt, Rinehart and Winston, 1965.

Garvey, James F. "The What and Why of Behavioral Objectives." The Instructor, April, 1968, p. 127.

Glaser, Robert (ed.). Training Research and Education. Pittsburgh: University of Pittsburgh Press, 1962.

Goodlad, John I. "Curriculum: The State of the Field." Review of Educational Research, June, 1960, pp. 185-198.

Goodlad, John I. School Curriculum and the Individual. Waltham, Massachusetts: Blaisdell Publishing Company, 1966.

Goodlad, John I. "The School Scene in Review." The School Review, LXVI, No. 4 (1958), 391-397

Goodlad, John I. The Teacher Selects, Plans, Organizes. Washington, D. C.: ASCD Yearbook, 1959.

Harmes, H. H. Behavioral Analysis of Learning Objectives. West Palm Beach, Florida: Harmes and Associates, 1969.

Herrick, V., and Tyler, Ralph W. Toward Improved Curriculum Theory. Chicago: University of Chicago Press, 1950.

Krathwohl, David R., et al. Taxonomy of Educational Objectives: Affective Domain. New York: David McKay Company, Inc., 1956.

Krumboltz, J. D. (ed.). Learning and the Educational Process. Chicago: Rand McNally and Company, 1965.

Lange, Carl J. Developing Programs for Teachers. Professional Paper 20-69. Alexandria, Virginia: Human Resources Research Office, The George Washington University, 1969.

Lavisky, Saul. "Faculty In-Service Training Programs and the Process of Educational Change," Alexandria, Virginia: Human Resources Research Organization, 1969. (Mimeographed.)

Logan, William B. "A Mod Model for Business Education Curriculum Planning." Paper presented at the Fall Conference of the California Business Education Teachers Association--Bay Area, Fremont, California, October 25, 1969.

Logan, William B. "The Pursuit of Excellence in Vocational Teacher Preparation." National Seminar Proceedings. Columbus, Ohio: The Center for Vocational and Technical Education, The Ohio State University, 1968.

Mager, Robert F. Developing Attitudes for Learning. Palo Alto, California: Fearon Publishers, 1968.

Mager, Robert F. Preparing Instructional Objectives. Palo Alto, California: Fearon Publishers, 1962.

Mager, Robert F. Preparing Objectives for Programmed Instruction. Palo Alto, California: Fearon Publishers, 1961.

Mager, Robert F., and Beach, Kenneth M. Developing Vocational Instruction. Palo Alto, California: Fearon Publishers, 1967.

McAshan, H. H. Writing Behavioral Objectives. University of Florida: Florida Educational Research and Development Council, 1969.

Miller, James G. "Living Systems: Basic Concepts." Behavioral Science, July, 1965, pp. 193-237.

Miller, James G. "Living Systems: Cross-Level Hypotheses." Behavioral Science, October, 1965, pp. 380-411.

Nerbovig, Marcella H. "Teachers' Perceptions of the Functions of Objectives." Unpublished Ph.D. dissertation, The Ohio State University, 1956.

Nerden, Joseph T. "Evaluation and Steps to Accreditation." American Vocational Journal, XLI (1966), 18-20.

Nuckols, Troy E., and Tingley, Donald E. "Development and Implementation of Terminal Performance Objectives in Typing." California Business Education Journal, January, 1969, pp. 8-12.

Oakleaf Elementary School. Behavioral Objectives for Reading. Pittsburgh, Pennsylvania: Baldwin-Whitehall School District.

Oakleaf Elementary School. Mathematics Continuum. Pittsburgh, Pennsylvania: Baldwin-Whitehall School District.

Ober, Richard L. Theory Into Practice Through Systematic Observation. FERDC Research Bulletin, Vol. IV, No. 1 (1968).

Ojemann, Ralph H. "Should Educational Objectives be Stated in Behavioral Terms?" Elementary School Journal, Vol. LXVIII, No. 5 (1968), pp. 223-231

Ojemann, Ralph H. "Should Educational Objectives be Stated in Behavioral Terms?: Part II." Elementary School Journal, Vol. LXIX, No. 5 (1969), pp. 229-235.

Okum, Laura, et al. Using a Curriculum Rationale. Los Angeles: University of California, Students' Store, 1966.

On Evaluating Title I Programs. Princeton: Educational Testing Service, 1966.

Parsons, Talcott, and Shils, Edward A. (eds.). Toward a General Theory of Action. Cambridge: Harvard University Press, 1951.

Phenix, Philip H. "Key Concepts and the Crisis in Learning." Teachers College Record, December, 1956, pp. 137-143.

Plowman, Paul. Behavioral Objectives Extension Service. Units I-VIII. Chicago: Science Research Associates, 1968-69.

Popham, W. James. "Probing the Validity of Arguments Against Behavioral Goals." Paper presented before the AERA, Chicago, 1968.

Popham, W. James. "Selecting Appropriate Educational Objectives." Los Angeles: Vincent Associates, 1967.

Popham, W. James. The Teacher-Empiricist. Los Angeles: Tinnon-Brown, 1965.

Raths, James D. "Specificity as a Threat to Curriculum Reform." Behavioral Objectives: Pro and Con. Florida Association for Supervision and Curriculum Development, December, 1968.

Sanders, Norris M. Classroom Questions, What Kind? New York: Harper and Row, 1966.

Smith, Robert G. Controlling the Quality of Training. Technical Report 65-6. Alexandria, Virginia: Human Resources Research Office, The George Washington University, 1965.

Smith, Robert G. The Design of Instructional Systems. Technical Report 66-18. Alexandria, Virginia: Human Resources Research Office, The George Washington University, 1966.

Smith, Robert G. The Development of Training Objectives. Research Bulletin 11. Alexandria, Virginia: Human Resources Research Office, The George Washington University, 1964.

Sweany, H. P. "Evaluation Must Be Complete." American Vocational Journal, XLI (1966), 14-16.

Tuckman, Bruce W. "An Evaluation Model for Education." Paper presented before the American Vocational Association, Dallas, Fall, 1968.

Tuckman, Bruce W., et al. "Induction and Transfer of Search Sets." Journal of Educational Psychology, LIX (1968), 59-68.

Tyler, Ralph W. Basic Principles of Curriculum and Instruction. Chicago: University of Chicago Press, 1950.

Tyler, Ralph W. "Changing Concepts of Educational Evaluation." Paper presented before the AERA, Chicago, February 17, 1966.

Uses of Task Analysis in Deriving Training and Training Equipment Requirements. Technical Report 60-593. Behavioral Sciences Laboratory, Aerospace Medical Laboratory, Wright-Patterson Air Force Base, Ohio, 1960.

Wood, Merle W. "The Numbers Game." California Business Education Journal, January, 1969, pp. 18-23.